

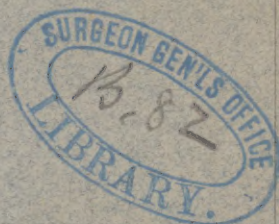
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DIPHTHONIA PARALYTICA.

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BY

ETHELBERT C. MORGAN, A. B., M. D.

*Late Assistant to Prof. Johannes Schnitzler, in the Department of Diseases
of the Throat and Lungs in the Poliklinik, Vienna, Austria.*



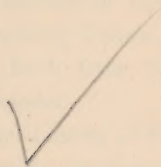
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DIPHTHONIA PARALYTICA.

Among the more interesting of the anomalies of the voice is diphthonia, or as it is denominated by Prof. Ludwig Türck, "Diphthonia Paralytica," an affection full of interest, both from the phenomena which it presents and the variety of its causes.

The literature of the subject is almost exclusively of German origin, and includes, among the rest, the following well-known authors: Schnitzler, (Wiener Med. Presse, 1874-5,) Müller, (Handbuch der Physiologie des menschen 2ter Band, 1840, pg. 187,) Stoerk, (Klinik der Krankheiten des Kehlkopfs, 1876, pg. 180,) Turck, (Klinik der Krankheiten des Kehlkopfs, pg. 465,) Rossbach, (Physiologie und Pathologie des menschlich Stimme 1ter Band, pg. 571,) and Merkel, (Anatomie und Physiologie des menschlich. Stimme, 1857, pg. 628.)

I have frequently examined patients whose voices were rendered diphthonic by the presence of a small tumor on one or both vocal cords, the diphthonia disappearing, in these cases, on the removal of the tumors; but cases supposed to arise from combined paresis of the "Transversus Laryngis and Thyreo-arytænoidei interni" are extremely rare—so rare that only a few cases have been reported.

Having had the good fortune to meet with a case of this kind, I submit it in order to assist in confirming the opinion that there is a relation (however remote it may be) existing between certain forms of diphthonia and combined paresis of the transversus and thyreo-arytænoidei interni.

James R——, student, a resident of Washington, age 19, who was referred to me for treatment by my friend, Dr. Wm. V. Marmion, gave the following history:

In the early part of 1878 he contracted a severe laryngeal catarrh, from which, without interruption, he has suffered, becoming hoarser from month to month, until at the time I saw him, October 19, 1878, when he was nearly aphonic.

I found him suffering with a chronic laryngeal catarrh, with little or no pain in the region of the larynx, and a slight cough was now and then observed, excited apparently by the contact of cold air with the inflamed laryngeal mucous membrane. The expectoration was

very scant, of a grayish color, tenacious and varied in quantity from day to day, but was always greater on rising in the morning than during the remainder of the day. His general health was excellent and was not in the least impaired by the existence of the laryngeal disease.

I at once made a laryngoscopic examination, employing the fixed laryngoscope of Dr. Krishaber, of which a drawing may be seen in Ziemssen's *Cyclopædia*, vol. iv, p. 25.

The condition of the larynx can be better understood from the drawings, which I have made with great care. The posterior surface of the epiglottis and the aryteno-epiglottidean folds were of a normal color; the arytenoid eminences were injected, as also the superior or false cords, which were swollen and bathed in a copious secretion. But in the inferior or true cords I detected lesions and important alterations in function meriting detailed description and explaining the development of the partial aphonia and diphthonia in the course of chronic laryngeal catarrh. The *membrana elastica laryngis* was in places tinged in a manner aptly described by Isambert, "*Comme un très léger coup de pinceau trempé dans du carmine.*" In other places this *membrana* was thickened and of a grayish color.

So far I had only observed the morbid changes in the intra-laryngean tissue, but upon requesting the patient to sound "a" as high as possible, to my surprise, I saw the condition as shown in wood-cut number 1. Cut number 2 represents the normal larynx during the

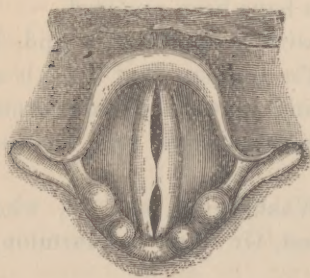


Fig. 1.

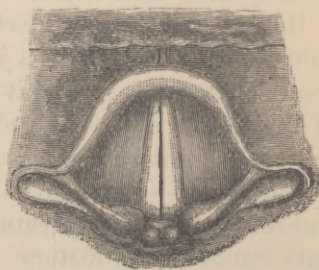


Fig. 2.

production of such a sound. It will be observed in figure 1 that the true vocal cords do not touch each other in all their length, as in figure 2; but only in their middle, and then for a distance of only two (2) mm. This phenomenon was observed on an effort to sound "a" being made, and at that moment I could hear a distinct "diphthonia," consisting of an ordinary "a" sound followed by a well-marked "falsetto," which imparted to the voice an agreeable and

indeed musical tone. The outline of the rima glottidis was completely altered by the cords approaching each other near their middle, and the appearance may be well compared to the "hour-glass glottis" spoken of by Browne, (*Diseases of the Throat*, London, 1878.) There were, in fact, two glottic orifices, an anterior enclosed by the cords, and a posterior, extending from near the processi vocales backward; the former is called by Professor Johannes Schnitzler bänder, (cord,) the latter knorpel-glottis, (cartilage glottis,) (*Wiener Med. Presse*, 1875.) From these words of Schnitzler we may arrive at what I think a rational explanation of the direct causation of the symptom diphthonia in this case. As will be seen by again examining figure 1, the anterior glottic orifice is longer than the posterior. Now, could the same sound be generated *cæteris paribus*, in glottic orifices differing in structure, in length, and in form? The following facts recorded by M. Mandl (*Maladies du Larynx et du Pharynx*, Paris, 1872, pg. 281,) bear directly on the point I am making, and I therefore translate them. "It is understood that vocal cords susceptible of variations in length, thickness, consistence, and humidity can vibrate differently and produce sounds the new harmonics of which give rise to a modification of tone."

"The 'tonalité' depends on the number of vibrations of the vocal cords and the size of the glottic orifice." The vibration of the cartilagenous portions of the vocal cords which are posterior to the processi vocales is less rapid, and hence the sound is less acute than in the anterior or ligamentous portions of the same cords. The sound produced in the cord glottis would be high; that in the cartilage glottis low. Schnitzler, (*Wiener Med. Presse*, 1875,) and Türck, (*Klinik der Krankheiten des Kehlkopfs*, pg. 465.)

Regarding the chronic laryngeal catarrh as being the cause of the paresis, and diphthonia a symptom of this paresis, my treatment was directed to the removal of catarrh, and then to the paresis by the use of intra and extralaryngeal faradization, and the administration of excito-motor stimulants. During the entire course of treatment, abstinence from alcoholic liquors, tobacco, and absolute rest of the voice was recommended. In five weeks I had the catarrh nearly entirely relieved, the voice meantime having become much more distinct. I used as a local application to the larynx, zinc chloride, 0.75 gm. in 32.00 of water, and as an inhalation, alum 15.00; aq. extract of opium, 0.20; glycerine, 50.00; rose water, 250.00. Both formulæ were made daily use of until I began faradization, which was two months from the commencement of the treat-

ment. A few days elapsed, and I then administered strychnia, 0.0003, three times a day during the first week and then every alternate week for four months. Faradization was accomplished with the apparatus of Professor Dubois Raymond, of Berlin. At the beginning I gave the patient a daily séance, then every alternate day, and finally once a week. There was a most pronounced improvement in his voice after the first application of electricity, and he is to-day practically in the possession of a perfect power of vocalization. The diphthonia has entirely disappeared and cannot be detected even on the patient's making the most violent efforts to sound high notes. The anterior and posterior glottic orifices have been transformed into one and extend from the anterior to the posterior commissure of the vocal cords, as is well represented in figure 2.

I have been struck with the similarity of position of the cords in this case, and in cases of combined paralysis of the transversus and thyreo-arytænoidei interni, the result of which is also an hour-glass glottis, but in the last-named cases which have come under my observation, there was complete loss of voice, the vocal cords remaining more widely separated during attempts at phonation than in the present case. When we reflect on the fact that paresis of the various laryngeal muscles is a common result of chronic catarrh, Ziemssens (*Cyclopædia*, vol. IV, p. 216) and Türck (*Klinik der Krankheiten des Kehlkopfs*, p. 465,) and the manner in which the diphthonia disappeared under the above-mentioned treatment, it is, I think, evident that in this case the diphthonia was due to a paresis.

Those interested in the mechanism of the voice are referred to the works of Fournié, Paris (1866) and J. Solis Cohen, New York, (1872.)

